ZEH: How do we get there from here?

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We’re already there….

http://www.ultimatefamilyhome.com/

Energy Goal:

Improve building energy performance by at least 25 percent over 2005 Title 24 standards and reduce net annual energy consumption by 70 percent.

- Envelope improvements: windows, insulation, framing, overhangs, orientation, simple shapes
- Lighting/appliances/hot water
- Building America already does this on a production scale in California
- Tougher in extreme climates

Shea – San Angelo – Lew Pratsch

Peak Demand Goal:

Reduce peak demand to no more than 1 kilowatt per house on a summer peak day.

- ZEH space conditioning PEAK ONLY
  - ignore SEER look at EER at design only
  - no heating with heat pumps
- Thermal mass, overhangs
- Luckily it's the sunshine state (and the "windy afternoon on the coastal range" state)
- Small capacity < onsite generation key to zero peak

Cost Goal:

Eliminate the out-of-pocket incremental initial cost of a ZENH house to the homeowner.

- Make the house smaller and use saved $$
  - Target audience/community
- Tax credits/ low interest loans/permit waivers
- Added cost is *relatively* small? Median CA house $465k.
- $100/month $\Rightarrow$ $15,000

Amenities & Transparency

- Individual buildings must provide all the amenities currently expected--PLUS the ZE benefits
- A home that must be operated in a special way to be comfortable is not mainstream.
- People want to be able to adjust their temperature just as they do now.
- People will want at least the same amount of flexibility to operate their thermostat or TV or cooker.
- People will expect to get good ventilation & IAQ, they will expect to have good lighting etc.
- They will expect the stereo to work even when it is dark outside.

To do list

- Address issues with code authorities for “different” structures
  - Proof of concept analyses
  - Anecdotes from existing structures
- Produce Guidelines using existing technology and “systems approach” – climate optimized
  - BA and DOE Guidelines
- Quality control/commissioning
  - Diagnostics: envelope leakage, duct leakage, refrigerant charge, air handler flow, air handler power consumption, mechanical ventilation air flows, etc.

FSEC- Livermore

http://www.fsec.ucf.edu/bldg/active/zeh/livermore/index.htm

NAHB - Tucson

http://www.nahbrc.org/tertiaryR.asp?TrackID=&CategoryID=1823&DocumentID=3688